

WHAT IS CLAIMED IS:

5            1.    An integrated photovoltaic roofing system for attachment to a roofing surface, comprising:

             at least one flexible membrane having a top surface and a bottom surface, the bottom surface for application to the roofing surface;

10           a plurality of elongated photovoltaic modules arranged side-by-side and attached to the top surface of the at least one flexible membrane;

             at least one conduit located at adjacent ends of the modules; and

15           a plurality of electrical leads in electrical connection with the modules and routed through the at least one conduit.

20           2.    The system of claim 1 further comprising a plurality of connectors attached to the electrical leads for connecting at least of portion of the electrical leads together.

25           3.    The system of claim 1 wherein each of at least a portion of the electrical leads have one end soldered to a module and another end attached to a connector.

             4.    The system of claim 3 further comprising at least one electrical lead with connectors attached to each end of the electrical lead for connecting to the at least a portion of the electrical leads.

30           5.    The system of claim 1 wherein at least one hole for routing the electrical leads is defined in a bottom side of the at least one conduit.

6.    The system of claim 1 wherein the at least one conduit is located above the modules.

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7.    The system of claim 1 wherein the at least one conduit comprises at least one support member.

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8.    The system of claim 1 wherein the modules are attached to the top surface of the at least one flexible membrane with an adhesive.

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9.    The system of claim 1 wherein at least one the flexible membrane comprises a single-ply membrane.

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10.   The system of claim 1 wherein the at least one flexible membrane is a thermoplastic membrane sheet, an elastomeric membrane sheet, or a reinforced bituminous membrane sheet.

11.   The system of claim 1 wherein each module includes a plurality of solar cells.

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12.   The system of claim 1 wherein each module is flexible.

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13.   The system of claim 1 further comprising a seal along at least one edge between the at least one flexible membrane and at least one of the modules.

14.   The system of claim 1 wherein the at least one flexible membrane and the modules attached to the at least one flexible membrane can be rolled upon themselves.

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15. The system of claim 1 wherein the at least one flexible membrane comprises a single sheet.

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16. The system of claim 1 wherein a first group of two or more modules is arranged side-by-side and a second group of two or more modules is arranged side-by-side, wherein the first and second groups are also arranged end-to end so that at least a portion of the electrical leads are located at adjacent ends of the modules of the first group and the second group.

17. An integrated photovoltaic roofing system for attachment to a roofing surface, comprising:

15 a flexible membrane having a top surface and a bottom surface, the bottom surface for application to the roofing surface;

20 a plurality of elongated photovoltaic modules arranged side-by-side and attached to the top surface of the at least one flexible membrane, each of the modules comprising a plurality of solar cells and a pair of electrical leads, each of the electrical leads of the electrical lead pairs having one end connected to one of the modules and having a connector attached to a free end; and

25 at least one conduit located at adjacent ends of the modules, wherein a plurality of holes are defined in at least one side of the at least one conduit.

30 18. The system of claim 17 further comprising a plurality of electrical leads having connectors attached to each end, wherein the connectors on the electrical leads are adapted to connect to the connectors attached to the free ends of the electrical leads of the electrical lead pairs.

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5      19. The system of claim 18 wherein inside the at least one conduit the connectors attached to the free ends of the electrical lead pairs are connected to the connectors on the electrical leads that have connectors attached to each end.

10      20. The system of claim 17 wherein the lead pairs are routed through the holes.

15      21. The system of claim 17 wherein each of the electrical lead ends connected to one of the modules are soldered to an electrical connector on a top surface of one of the modules.

20      22. The system of claim 17 wherein the at least one conduit is located above the modules and the at least one side of the at least one conduit is a bottom side.

23. An integrated photovoltaic roofing panel for attachment to a roofing surface, comprising:

25      a flexible membrane having a top surface and a bottom surface, the bottom surface for application to the roofing surface;

    a plurality of elongated photovoltaic modules arranged side-by-side and attached to the top surface of the at least one flexible membrane;

30      a plurality of electrical leads located at adjacent ends of the modules, each of the electrical leads having one end in electrical connection with one of the modules and having a connector attached to a free end.

24. The system of claim 23 wherein each of the  
electrical lead ends connected to one of the modules are  
5 soldered to an electrical connector on a top surface of one of  
the modules.

25. A method of installing an integrated photovoltaic  
roofing system comprising at least one flexible membrane  
10 having a top surface and a bottom surface, the bottom surface  
for application to the roofing surface, a plurality of  
elongated photovoltaic modules arranged side-by-side and  
attached to the top surface of the at least one flexible  
membrane, and at least one conduit, the method comprising:

15      attaching the bottom surface of the at least one flexible  
membrane to a roofing surface;

         installing the at least one conduit at adjacent ends of  
the modules;

20      routing electrical leads from the modules through at  
least one hole defined in at least one side of the at least  
one conduit; and

         connecting at least a portion of the electrical leads  
together in the at least one conduit.

25      26. The method of claim 25 wherein connecting comprises  
attaching electrical leads to the electrical leads from the  
modules.

30      27. The method of claim 25 wherein connecting comprises  
connecting electrical leads, having connectors attached to  
each end, to connectors connected to free ends of the  
electrical leads from the modules.

28. The method of claim 25 wherein:  
each of the electrical leads from the modules have  
5 connectors attached to a free end; and  
connecting comprises connecting the connectors attached  
to the free ends of the electrical leads from the modules to  
connectors on electrical leads that have connectors attached  
to each end.

10 29. The method of claim 25 wherein the at least one side  
of the at least one conduit is a bottom side.

30. The method of claim 25 further comprising attaching  
15 connectors to free ends of the electrical leads.

31. The method of claim 25 wherein installing comprises  
positioning the at least one conduit above the modules.

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